I. INTRODUCTION AND QUALIFICATIONS

- 2 Q. PLEASE STATE YOUR NAME, EMPLOYER, AND BUSINESS ADDRESS.
- A. My name is Steven E. Turner. Currently, I head my own telecommunications and
- 4 financial consulting firm, Kaleo Consulting. My business address is 2031 Gold Leaf
- 5 Parkway, Canton, Georgia 30114.

- 6 Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND.
- A. I hold a Bachelor of Science degree in Electrical Engineering from Auburn University in
- 8 Auburn, Alabama. I also hold a Masters of Business Administration in Finance from
- 9 Georgia State University in Atlanta, Georgia.
- 10 Q. PLEASE SUMMARIZE YOUR PROFESSIONAL EXPERIENCE.
- 11 A. From 1986 through 1987, I was employed by General Electric in their Advanced
- Technologies Department as a Research Engineer developing high-speed graphics
- simulators. I joined AT&T in 1987 and, during my career there, held a variety of
- engineering, operations, and management positions. These positions covered the
- switching, transport, and signaling disciplines within AT&T. From 1995 until 1997, I
- worked in the Local Infrastructure and Access Management organization within AT&T.
- 17 It was during this tenure that I became familiar with the many regulatory issues
- surrounding AT&T's local market entry, and specifically with the issues regarding the
- unbundling of incumbent local exchange carrier ("ILEC") networks. I formed Kaleo
- 20 Consulting in January 1997. I consult primarily on regulatory issues related to facilities-
- based entry into local exchange service and, using financial models, advise companies
- on how and where to enter telecommunications markets.

1	Q.	HAVE YOU TESTIFIED IN OTHER REGULATORY PROCEEDINGS?
2	A.	Yes. I have filed testimony or appeared before commissions in the states of Alabama,
3		Arkansas, California, Colorado, Delaware, Florida, Georgia, Hawaii, Illinois, Kansas,
4		Kentucky, Louisiana, Massachusetts, Michigan, Minnesota, Mississippi, Missouri,
5		Nebraska, Nevada, New York, Ohio, Oklahoma, Pennsylvania, Texas, Washington,
6		and Wisconsin. Additionally, I filed testimony with the Federal Communications
7		Commission ("FCC") regarding Southwestern Bell Telephone Company's ("SWBT")
8		compliance with Section 271 of the Telecommunications Act of 1996 (the "Act"). A
9		copy of my resume is attached as Attachment SET-1.
10	II.	PURPOSE AND SUMMARY OF TESTIMONY
10 11 12	II. Q.	PURPOSE AND SUMMARY OF TESTIMONY PLEASE DESCRIBE THE PURPOSE OF YOUR TESTIMONY AND PROVIDE A SUMMARY OF ITS CONCLUSIONS.
11		PLEASE DESCRIBE THE PURPOSE OF YOUR TESTIMONY AND
11 12	Q.	PLEASE DESCRIBE THE PURPOSE OF YOUR TESTIMONY AND PROVIDE A SUMMARY OF ITS CONCLUSIONS.
11 12 13	Q.	PLEASE DESCRIBE THE PURPOSE OF YOUR TESTIMONY AND PROVIDE A SUMMARY OF ITS CONCLUSIONS. I was asked by AT&T and WorldCom to review Verizon-MA's claimed interoffice
11 12 13	Q.	PLEASE DESCRIBE THE PURPOSE OF YOUR TESTIMONY AND PROVIDE A SUMMARY OF ITS CONCLUSIONS. I was asked by AT&T and WorldCom to review Verizon-MA's claimed interoffice transport and common (shared) transport costs and its claimed collocation costs. This
11 12 13 14	Q.	PLEASE DESCRIBE THE PURPOSE OF YOUR TESTIMONY AND PROVIDE A SUMMARY OF ITS CONCLUSIONS. I was asked by AT&T and WorldCom to review Verizon-MA's claimed interoffice transport and common (shared) transport costs and its claimed collocation costs. This reply testimony identifies and explains the errors that Verizon-MA made with regard to

looking economic costs for dedicated interoffice transport and common (shared) transport. For dedicated interoffice transport, Verizon-MA made fundamental methodological errors in its study. One of the most significant is Verizon-MA's understatement of the capacity of the SONET rings, thereby significantly overstating the costs for the circuits riding those SONET rings. In addition, Verizon-MA fails to study

the dedicated transport circuits that are used by Verizon in its local network focusing instead on those that are used to serve IEC POP customers. Verizon-MA's cost study also improperly includes Digital Cross-connect System ("DCS") on most dedicated transport circuits regardless of whether the competitive local exchange carrier ("CLEC") elects this element or not. Consistent with the Verizon-MA/AT&T interconnection agreement, the Verizon-MA/MCImetro interconnection agreement, and the FCC's Advanced Services Order, DCS should be treated as a separate unbundled element, which a CLEC has the option to purchase based upon weighing both the added cost and associated benefits of DCS combined with dedicated transport. Finally, Verizon-MA's cost study also utilizes an installation factor for transport equipment that is significantly higher than even Verizon's own data demonstrates to be reasonable. This testimony also shows that Verizon-MA's development of the fill factors for DS1 to DS0 and DS3 to DS1 multiplexing do not adequately account for how this element is used by the CLEC.

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Further, this testimony shows that Verizon-MA has significantly overstated the costs for common (shared) transport. Particularly, Verizon-MA has based the cost for common transport on its underlying dedicated transport cost study. Given that the corrections that I propose to Verizon-MA's dedicated transport cost study alter these costs, the results should also be incorporated into the common transport cost study. Additionally, Verizon-MA has significantly overstated the distance between its central offices in developing the cost for common transport thereby overstating the rate for this

element. I have altered the mileage to a figure that would be much closer to the appropriate TELRIC distance for this element.

With regard to collocation, this reply testimony shows that Verizon-MA has significantly overstated the costs for collocation particularly related to DC Power and land and building space. Verizon-MA makes numerous and considerable errors in its proposed collocation cost studies that cause the resulting costs to no longer comport with the Total Element Long Run Incremental Cost ("TELRIC") principles required and adopted by the Department of Telecommunications and Energy ("DTE"). Several of Verizon-MA's proposed collocation rates represent significant departures from an efficient, forward-looking approach to developing the costs for collocation. Further, Verizon-MA has developed its collocation costs in a manner that clearly discriminates against CLECs with regard to the configuration used to deliver DC power. In short, Verizon-MA's proposed collocation costs particularly for DC Power should be rejected.

III. VERIZON-MA'S CLAIMED INTEROFFICE DEDICATED TRANSPORT

COSTS

A. Correction of Ports Per Node Calculation

18 Q. HOW HAS VERIZON-MA INFLATED ITS CLAIMED INTEROFFICE 19 DEDICATED TRANSPORT COSTS?

A. By significantly understating the number of ports that must be utilized at each SONET node to provide 48 DS3s on the SONET ring, Verizon-MA has significantly overstated

1		its investment per DS3, which results in substantially inflated claimed dedicated
2		interoffice transport costs.
3 4 5	Q.	IN WHAT WAY HAS VERIZON-MA SIGNIFICANTLY UNDERSTATED THE NUMBER OF PORTS THAT ARE UTILIZED ON ITS SONET RINGS IN ITS COST STUDY?
6	A.	Verizon-MA indicates in its interoffice dedicated transport cost study that the capacity
7		of an OC-48 Bi-directional Line Switched Ring ("BLSR") is 48 DS3s. In addition,
8		Verizon-MA asserts that it has on average 3.83 nodes per SONET ring. ² In order to
9		support 48 DS3s within a SONET ring, 96 ports must be used within the SONET
10		nodes. The reason for this is that each DS3 must have a port to enter the SONET ring
11		at one node and a second port to depart the SONET ring at another node.
12		Consequently, given Verizon-MA's assumptions of 48 DS3s per SONET ring and 3.83

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nodes per SONET ring, each node must have on average approximately 25 ports.³

Workpaper Part D-6, MA01-20 IOF Invest Worksheet, "Parameters" Spreadsheet, Row 55. Verizon-MA assumes that the OC-48 rings have a capacity of 48 DS3s and OC-12 rings have a capacity of 12 DS3s. Interestingly, the remainder of the cost study is completely based on *only* OC-48 technology and as such, the OC-48 and OC-12 weighting that Verizon does here is inconsistent with this approach. As such, I have slightly modified Verizon's value here to be 48 DS3s as it should be consistent with the remainder of the cost study. This has little bearing on the resulting costs. Please note that the assumption of 48 DS3s per OC-48 BLSR is actually a conservative estimate. In reality, BLSR SONET rings can support more than 48 DS3s depending on the number of nodes on the ring and depending on the network engineering applied. The engineering rule is simply that no cross section between two nodes on the SONET ring can exceed 48 DS3s. This engineering rule, though, can permit more than 48 DS3s on the SONET ring as a whole. In short, while the remainder of this testimony will assume Verizon-MA's assumption of 48 DS3s per OC-48 SONET ring (but account for this correctly), the Department should realize that this is a very conservative assumption from a cost standpoint.

Workpaper Part D-6, MA01-20 IOF Invest Worksheet, "Parameters" Spreadsheet, Row 54.

Mathematically, the 25-port figure is derived as follows: For the 3-node scenario, the 96 ports are distributed among the 3 nodes with 32 ports (96 / 3) on average. For the 4-node scenario, the 96 ports are distributed among the 4 nodes with 24 ports (96 / 4) on average. Given the average of 3.83 nodes per ring, the 3-node scenario would occur 17 percent of the time and the 4-node scenario 83 percent of the time. Using this distribution to determine the number of ports per node yields a total

Verizon-MA's interoffice dedicated transport cost study, however, assumes only 16
ports per node, understating the number of required ports under its analysis by 56.3
percent.⁴

Q. HOW DOES THIS IMPACT VERIZON-MA'S COST ANALYSIS?

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A. Since the bulk of the costs associated with SONET rings is a fixed cost based on physically establishing the SONET node, the vast majority of the investment must be made irrespective of whether one DS3 is in service or 48 DS3s are in service at the particular SONET node. In performing its cost analysis, Verizon-MA averages this total cost across the number of ports that are assumed at the SONET node. As a result, it is vitally important to accurately determine the average number of ports per node so as to not misstate this average investment per port. By understating the number of ports per node by 56.3 percent for DS3s, Verizon-MA has commensurately overstated the investment per DS3 in its cost calculation, which ultimately inflated its claimed interoffice dedicated transport costs.

15 Q. IS VERIZON-MA'S FLAWED ANALYSIS SIMPLY THE RESULT OF A 16 MISCALCULATION?

17 A. It appears that Verizon-MA took the 48 DS3s per SONET ring and divided by three
18 nodes (the more conservative of the whole number of nodes surrounding the average of
19 3.83 nodes) and calculated 16 ports. Unfortunately, Verizon-MA's flawed

of 25.36 ports per node (32 * 0.17 + 24 * 0.83). I have rounded this value to 25 ports for my analysis.

It is important to note that Verizon-MA also uses a 75 percent fill factor as well in developing the cost for interoffice dedicated transport. This factor has not been altered in the restated cost study. However, Verizon-MA's understatement of the capacity of the OC-48 is only compounded by this fill factor.

1		methodological approach fails to recognize that the 16 ports that occur at one location
2		as one-third of the DS3s on the SONET ring must also terminate at another node on the
3		SONET ring thereby doubling the value to 32.
4 5 6 7	Q.	GIVEN THAT THE 3-NODE SCENARIO USED BY VERIZON INCORRECTLY PRODUCES THE LOWER COST AS COMPARED TO A 4-NODE SCENARIO, DID YOU USE THE 3-NODE SCENARIO ONLY AS DID VERIZON-MA?
8	A.	No.
9 10	Q.	WHY DID YOU NOT USE THE 3-NODE SCENARIO ONLY AS DID VERIZON-MA?
11	A.	While this approach would have yielded a lower cost, it is not consistent with the other
12		assumptions made within Verizon-MA's cost study (3.83 nodes per SONET ring) -
13		assumptions that I believe are appropriate, but should be consistently utilized within the
14		entire cost study. ⁵
15 16	Q.	DOES THIS PROBLEM AFFECT VERIZON-MA'S CLAIMED COSTS FOR OTHER SPEEDS OF DEDICATED TRANSPORT?
17	A.	Yes, Verizon-MA's flawed analysis likewise resulted in inflated cost claims for DS1 and
18		DS0 dedicated transport because the DS3 Dedicated Transport cost study is used as
19		the basis for the DS1 and DS0 Dedicated Transport cost studies. Consequently, the
20		required correction to Verizon-MA's DS3 Dedicated Transport cost study will directly
21		flow through into these downstream cost studies. Verizon-MA also made the same

Please note that my reference in this regard to the number of nodes per ring is to the "logical" number of nodes that are on a particularly SONET ring. Often there will be many more "physical" nodes on fiber rings where the fiber passes through the node, but SONET electronics are not placed on the node in that office. Nonetheless, the important factor in this regard for developing the number of ports per node is the number of "logical" nodes per ring in that this relates to the electronics that are placed at those nodes.

- type of error in its STS-1 and OC3 Dedicated Transport cost studies. The correct
- 2 number of ports per node for these speeds of dedicated transport using the approach
- detailed above for DS3s is 25 and eight, respectively. Instead, Verizon-MA
- 4 incorrectly used 16 and six, respectively, which substantially inflated its claimed costs.

5 Q. COULD YOU PLEASE SUMMARIZE THE IMPACT OF THIS

6 CORRECTION IN VERIZON-MA'S COST STUDY FOR THE VARIOUS

FORMS OF DEDICATED TRANSPORT?

A. Yes. The following table summarizes the average investment per port before under

Verizon-MA's incorrect analysis compared to the restatement that I have done for each

of the various forms of dedicated transport. The average investment uses the same split

between Fujitsu and Lucent equipment contained in Verizon-MA's original cost study.

Port Type	Corrected Investment Level for Verizon-MA's Cost Study	Verizon-MA's Claimed Investment Level
OC-48 – OC-3 Ports	\$7,380.48	\$9,381.76
OC-48 – STS-1 Ports	\$2,154.09	\$3,215.01
OC-48 – DS3 Ports	\$2,054.26	\$3,059.04

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Q. WHAT RESPONSE DO YOU EXPECT VERIZON-MA TO MAKE TO YOUR CRITICISM REGARDING THE NUMBER OF PORTS PER NODE?

15 A. In New York, I made this same criticism against Verizon's filing. Verizon even acknowledged that the criticism was accurate, as did the New York commission.

An OC-48 SONET ring has a capacity of 48 STS-1 circuits therefore requiring 96 STS-1 ports on the nodes of the SONET ring. An OC-48 SONET ring has a capacity of 16 OC-3 circuits therefore requiring 32 OC-3 ports on the nodes of the SONET rings. An OC-48 SONET ring has a capacity of four OC-12 circuits therefore requiring eight OC-12 ports on the nodes of the SONET rings. The remaining calculations to determine the number of ports per node for the SONET rings are then identical to those outlined for the DS3 ports.

However, Verizon's response was that it did not actually use the 3.83 nodes per ring, but rather used six nodes per ring. Unfortunately, to my knowledge the New York proceeding did not provide a second round of testimony to rebut this claim by Verizon. Moreover, if Verizon makes this claim in its rebuttal testimony, the Massachusetts procedural schedule also will not provide an opportunity. As a result, in the event that Verizon makes this same type of claim, I wanted to respond to it ahead of time.

Verizon-MA has made it clear that its present dedicated transport usage requires 3.83 nodes per ring.⁷ Verizon in New York assumed a similar level (3.76 nodes per ring).⁸ Verizon's claim in its last round of testimony in New York, however, was that the forward-looking number of nodes per ring should be six, thereby supporting the 16 ports for node that Verizon was using.⁹ In New York, I did not have a chance to respond to this claim. The claim is simply not possible. Given the growth in data traffic that is occurring and related growth in transport necessary to support this traffic, the forward-looking impact on SONET network engineering is to realize *smaller* numbers of nodes per ring – not *larger* number of nodes per ring.¹⁰ In other words, it is

Workpaper Part D-6, MA01-20 IOF Invest Worksheet, "Parameters" Spreadsheet, Row 54.

State of New York Public Service Commission, *Proceeding on Motion of the Commission to Examine New York Telephone Company's Rates for Unbundled Network Elements*, Case 98-C-1357, Workpaper Part C-1 – Section 1.0 to the Panel Testimony of Bell Atlantic – New York on Revised Costs and Rates for Unbundled Network Elements and Related Wholesale Services, February 24, 2000, p. 6 (line 372). Please note that this exhibit can also be found as Exhibit 323 in the New York UNE cost proceeding.

If Verizon were correct in using six nodes per OC-48 ring, then the resulting number of ports would be 16.

There is another forward-looking impact: Some networks are migrating away from OC-48 transport to OC-192 effectively quadrupling the capacity of the transport network. In doing this, incumbents

not reasonable for Verizon to argue that the forward-looking number of nodes per ring should be anything but 3.83 or lower.

B. Correction to Permit the CLEC Election of DCS

Q. WHAT IS DCS?

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A.

DCS is an acronym for "Digital Cross-connection System." DCS allows for telecommunications providers to electronically cross connect different speeds of dedicated transport on to one another. In other words, this piece of equipment allows the telecommunications carrier to take multiple DS1 dedicated transport circuits, entrance facilities, or loops and place them (also referred to as grooming) onto a DS3 circuit that can then be carried to another location. Other pieces of equipment are able to perform the same function as DCS and do so with a much lower level of investment. As such, DCS is normally and economically used when the electronic capability is most necessary such as in situations where many changes are expected in the circuits that go between two locations or when the ability to re-provision circuits across different high speed transport is important. It is because of these cost and performance trade-offs that incumbents make the choice of when and where DCS should be utilized in dedicated transport circuits. CLECs should have the same opportunity to make this choice through unbundling.

Q. HOW HAS VERIZON COSTED AND PRICED DCS?

20 A. Verizon has averaged the cost of DCS into its prices for interoffice transport.

could then increase the number of nodes per ring, but the unit cost per DS3 would be significantly reduced when moving from OC-48 to an OC-192 network.

Q. IS THIS APPROPRIATE? 1 2 A. No. As I indicated above, it is important that CLECs have the same opportunity that incumbents have to decide when and where DCS should be utilized in dedicated 3 transport circuits. 4 5 Q. DO YOU BELIEVE THAT IT IS PERMISSIBLE UNDER THE FCC FIRST REPORT AND ORDER TO SEPARATELY ORDER DEDICATED 6 TRANSPORT AND DCS? 7 A. Yes. There is an extensive discussion of the unbundling of DCS in the FCC First 8 Report and Order. Specifically, the FCC made the following conclusion: 9 Accordingly, we conclude that the section 251(d)(2)(B) requires 10 incumbent LECs to provide access to shared interoffice facilities and 11 dedicated interoffice facilities between the above-identified points in 12 incumbent LECs' networks, including facilities between incumbent 13 LECs' end offices, new entrant's switching offices and LEC switching 14 offices, and DCSs. We believe that access to these interoffice facilities 15 will improve competitors' ability to design efficient network architecture, 16 and in particular, to combine their own switching functionality with the 17 incumbent LEC's unbundled loops.11 18 19 With this language, the FCC requires that the new entrant be permitted to have access 20 to DCS. It is equally true, however, that the new entrant should be permitted to elect 21 not to purchase this element since technology affords other alternatives for 22 accomplishing the same functionality as DCS, in a much less costly manner (e.g., ATM 23 switching). DOES VERIZON-MA PROVIDE ACCESS TO DCS ON A SEPARATE 24 Q. 25 **BASIS ALREADY?**

FCC First Report and Order, FCC Docket No. 96-325, ¶ 447.

1 A. Yes. Verizon-MA has a Special Access Tariff (Tariff No. 11) that provides access to 2 DCS functionality known as Enterprise Network Reconfiguration Service ("ENRS"). This service permits "customers to reconfigure Special Access Services connected at 3 4 Digital Cross-connect Systems." Moreover, this tariff goes on to explain that the price for the network access ports on the DCS is "determined by the type of Special Access 5 Service that is associated with the port."¹³ As such, if the customer wants to connect 6 DS3 Special Access Service to the DCS, the customer must purchase a DS3 network 7 8 access port at the DCS. In short, this is precisely the approach that I would propose be utilized to establish costs for interoffice dedicated transport for unbundling. 9 Moreover, the FCC explicitly requires that the incumbents make DCS available in the 10 same manner for unbundling that it makes it available for special access.¹⁴ 11 Q. DO THE INTERCONNECTION AGREEMENT BETWEEN AT&T AND 12 VERIZON-MA, AND WORLDCOM AND VERIZON-MA AFFORD THE 13 OPPORTUNITY TO PURCHASE DCS WITH DEDICATED TRANSPORT? 14 A. Section 2.9.5.2 of the agreement between AT&T and Verizon-MA provides that 15 dedicated transport includes DCS as an option where available. Likewise, Section 16 10.2.11 of the agreement between WorldCom subsidiary MCImetro Access 17 Transmission Services, Inc. and Verizon-MA requires Verizon-MA to "offer Dedicated 18 19 transport together with and separately from DCS wherever DCS equipment is available." 20

Verizon-Massachusetts Special Access Tariff FCC No. 11, Section 19.1.

Verizon-Massachusetts Special Access Tariff FCC No. 11, Section 19.4.2.

FCC First Report and Order, FCC Docket No. 96-325, ¶ 444.

1 2 3	Q.	USING PERMIT IT TO EASILY SEPARATE DCS FROM THE DEDICATED TRANSPORT?
4	A.	Yes. Based on the diagrams provided by Verizon-MA with its cost study, Verizon-
5		MA always places DSX cross-connect points on each side of the DCS. As such, the
6		dedicated transport, which appears at the DSX, can be readily separated from the
7		DCS, which also appears at the DSX, so that the new entrant can either purchase these
8		two elements combined (if DCS is available) or separated.
9 10	Q.	WHAT IS THE COST IMPACT OF THIS RESTATEMENT TO THE VERIZON-MA COST STUDY?
11	A.	Fundamentally, there is no cost impact. Verizon-MA had already chosen to price
12		multiplexing as a separate element within the interoffice dedicated transport cost study.
13		My restatement of Verizon-MA's cost study simply affects the same approach for DCS
14		by separately developing the cost for this element from the dedicated transport element.
15		I have made no underlying changes to Verizon-MA's cost for DCS. I have simply
16		separately identified the cost for DCS for the various port types that are available on
17		DCS.
18		C. Correction to Multiplexing Fill Factors
19 20	Q.	WHAT IS THE CONCERN WITH VERIZON-MA'S MULTIPLEXING FILL FACTORS?
21	A.	When a CLEC purchases DS1 to DS0 multiplexing, the CLEC is purchasing the entire
22		capacity of the DS1 multiplexing equipment. As such, Verizon-MA does not bear any
23		risk if the CLEC does not utilize this entire element. In other words, if the CLEC elects
24		to only use three of the available 24 channels, the CLEC will have paid Verizon-MA for

1		the entire DS1 worth of capacity and Verizon-MA will bear no risk or cost associated
2		with the multiplexing equipment not having 21 of the 24 channels used. Because of this
3		approach to costing the multiplexing equipment, the utilization factor for the DS1 to DS0
4		multiplexing equipment should be 1.00.
5 6	Q.	HAVE YOU APPLIED THE 1.00 FACTOR TO EVERY INVESTMENT INPUT FOR DS1 TO DS0 MULTIPLEXING?
7	A.	No. While the discussion above is true for the multiplexing equipment, it is not true for
8		the frame equipment where the DS1 and DS0 circuits are terminated. For these
9		investment elements, I have retained the 75 percent fill factor used by Verizon-MA.
10 11	Q.	HAVE YOU MADE THIS SAME CHANGE FOR DS3 TO DS1 MULTIPLEXING?
12	A.	No. Effectively, Verizon-MA has not provided a cost study that is strictly for DS3 to
13		DS1 multiplexing. Instead, Verizon-MA has developed the cost for using DCS to
14		provide multiplexing functionality. While this application of DCS is a legitimate one, the
15		purchase of this multiplexing element precludes the CLEC from the other advantages of
16		DCS that are available in buying DCS as a separate element. Nonetheless, given that
17		Verizon-MA used DCS as the underlying component to develop DS3 to DS1
18		multiplexing cost, the use of a fill factor less than 1.00 in this instance would be
19		appropriate.
20		D. Correction to Transport Equipment In-Place Factor
21	Q.	FIRST, WHAT IS AN IN-PLACE FACTOR?
22	A.	Verizon-MA, in most instances, has determined what the material investment is for each
23		of the elements in its cost study. However, it has not separately identified the installation

and miscellaneous costs necessary to put the material investment into operation – or "inplace." The in-place factor is intended to gross up the investment to bring it to a level that represents the total installed cost of telecommunications equipment.

4 Q. WHAT IS YOUR CONCERN WITH THE IN-PLACE FACTOR USED BY VERIZON-MA?

A. The problem with the factor that Verizon-MA has used is that it is not representative of
TELRIC cost for this element. In my experience, the in-place cost for transmission
equipment should be in the 30 percent range. Verizon has proposed an in-place factor
for transmission equipment of 53.2 percent in Massachusetts, which is significantly
greater than what I have observed to be cost-based.

Q. WHAT IN-PLACE FACTOR WOULD YOU RECOMMEND FOR MASSACHUSETTS?

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A.

In the New York UNE cost proceeding, Verizon presented a transmission equipment in-place factor of 36.4 percent.¹⁵ There is no reason to believe that installation costs in Massachusetts should be 46 percent greater that those in New York. Verizon uses the same equipment vendors for transport equipment in New York as in Verizon so it is unlikely that such a large difference could be supported. Moreover, AT&T made every effort to obtain support from Verizon for its in-place factors in Massachusetts and never did receive the support documentation. In short, in light of Verizon's lack of support and the exceeding difference between Verizon's in-place factor for transport equipment

State of New York Public Service Commission, *Proceeding on Motion of the Commission to Examine New York Telephone Company's Rates for Unbundled Network Elements*, Case 98-C-1357, Workpaper Part C-1 – Section 1.0 to the Panel Testimony of Bell Atlantic – New York on Revised Costs and Rates for Unbundled Network Elements and Related Wholesale Services, February 24, 2000, p. 3. Please note that this exhibit can also be found as Exhibit 323 in the New York UNE cost proceeding.

in Massachusetts as compared to New York, I would recommend that the Department
use the New York value.

E. Correction to IOF Transport Study Type

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4 Q. ARE THERE ANY OTHER CORRECTIONS THAT YOU MADE TO THE 10F TRANSPORT STUDY DONE BY VERIZON?

6 A. Yes. There is one other unusual problem with Verizon's dedicated transport cost study that has to do with the study type that Verizon used for Massachusetts. Specifically, 7 Verizon has two options available for the dedicated transport cost study: (1) 8 INTRALATA and (2) IEC POP. In the INTRALATA cost study option, Verizon-MA 9 generally studies the costs for transport between any two of its central offices. Given 10 that the UNE proceeding is attempting to evaluate the costs of Verizon's transport 11 between its central offices generally, this seems to be the appropriate choice. 12 Moreover, this is the type of transport cost study that Verizon provided in New York.¹⁶ 13 14 The IEC POP cost study, on the other hand, does not study the transport costs 15 between any two of Verizon's central offices, but effectively assumes that one end of the transport is always for a central office connected to a POP. This has a significant 16 cost impact because Verizon assumes that transport that goes to central offices serving 17 POPs is more complex than in its other central offices. This option in the cost study 18

State of New York Public Service Commission, *Proceeding on Motion of the Commission to Examine New York Telephone Company's Rates for Unbundled Network Elements*, Case 98-C-1357, Workpaper Part C-1 – Section 1.0 to the Panel Testimony of Bell Atlantic – New York on Revised Costs and Rates for Unbundled Network Elements and Related Wholesale Services, February 24, 2000, p. 3. Please note that this exhibit can also be found as Exhibit 323 in the New York UNE cost proceeding.

- effectively skews the costs significantly above what Verizon would actually experience
- between its own central offices the cost that is to be studied in this proceeding.

3 Q. WHAT RECOMMENDATION WOULD YOU MAKE?

- 4 A. Quite simply, the IOF Transport cost study should be run with the INTRALATA option.
- F. Summary of Corrections to Verizon-MA's Interoffice Dedicated
 Transport Cost Study

Q. COULD YOU PLEASE SUMMARIZE THE INTEROFFICE DEDICATED TRANSPORT RATES THAT RESULT FROM YOUR CHANGES TO BAMA'S COST STUDY?

12 Yes. The following table summarizes the proposed rates for interoffice dedicated
12 transport that are derived from my restatement of Verizon-MA's cost study based on
13 the criticisms and corrections identified above. Also, please note that these
14 modifications also adjust the annual cost factors and overhead factors addressed in
15 Michael R. Baranowski's testimony on behalf of AT&T and WorldCom.

Rate Element	AT&T Monthly Rate	Verizon Monthly Rate
DS0 Dedicated Transport (Fixed)	\$18.00	NA
DS0 Dedicated Transport (Per Mile)	\$0.04	NA
DS1 Dedicated Transport (Fixed) ¹⁷	\$23.26	\$46.42
DS1 Dedicated Transport (Per Mile)	\$0.88	\$1.41
DS3 Dedicated Transport (Fixed) ¹⁸	\$157.00	\$768.89
DS3 Dedicated Transport (Per Mile)	\$11.85	\$19.86

It is difficult to precisely compare the AT&T and Verizon-MA proposed rates for dedicated transport in that Verizon-MA has averaged DCS investment into its rates rather than allowing CLECs to elect this UNE if it wants to as does Verizon. Nonetheless, allowing CLECs to elect DCS accounts for 72.7 percent of the investment difference between AT&T and Verizon.

For DS3 dedicated transport, allowing CLECs to elect DCS accounts for 14.6 percent of the investment difference between AT&T and Verizon.

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STS-1 Dedicated Transport (Fixed) ¹⁹	\$163.57	\$784.66
STS-1 Dedicated Transport (Per Mile)	\$11.99	\$20.22
OC-3 Dedicated Transport (Fixed) ²⁰	\$502.82	\$2,253.18
OC-3 Dedicated Transport (Per Mile)	\$37.33	\$60.05
OC-12 Dedicated Transport (Fixed)	\$1,688.09	\$2,596.78
OC-12 Dedicated Transport (Per Mile)	\$81.05	\$117.03
OC-48 Dedicated Transport (Fixed)	\$964.13	\$1,483.12
OC-48 Dedicated Transport (Per Mile)	\$8.51	\$11.49
Multiplexing DS1 to DS0 – Common	\$172.06	\$352.90
Multiplexing DS1 to DS0 – Plug-In	\$7.17	\$14.70
Multiplexing STS-1/DS3 to DS1	\$266.29	\$546.19
Multiplexing STS-1/DS3 to DS1 – Plug-In	\$9.51	\$19.51
DCS DS1 Port	\$6.35	NA
DCS DS3 Port	\$121.77	NA
DCS STS-1 Port	\$121.77	NA
DCS OC-3 Port	\$341.20	NA

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IV. <u>VERIZON-MA'S CLAIMED COMMON (SHARED) TRANSPORT COSTS</u>

Q. WHAT CONCERNS DO YOU HAVE WITH VERIZON-MA'S COMMON (SHARED) TRANSPORT COST STUDY?

6 (hereafter, "common transport") the cost from the dedicated transport cost study for
7 DS1 Dedicated Transport and STS-1 Dedicated Transport. Fundamentally, there is no
8 problem with using these elements as the underlying cost for the transport in common
9 transport. However, given that these costs have been restated as discussed above, the
10 resulting costs should also be incorporated into the common transport cost study.

For STS-1 dedicated transport, allowing CLECs to elect DCS accounts for 14.4 percent of the investment difference between AT&T and Verizon.

For OC-3 dedicated transport, allowing CLECs to elect DCS accounts for 15.6 percent of the investment difference between AT&T and Verizon.

Second, Verizon-MA has significantly overstated the weighted average distance

between its wire centers in developing the cost for common transport.

Q. WHAT APPROACH SHOULD BE USED IN DEVELOPING THE WEIGHTED AVERAGE DISTANCE BETWEEN WIRE CENTERS?

5 A. Verizon-MA should have evaluated how its switched transport network is used to
6 develop the average distance between its wire centers. Specifically, Verizon-MA
7 should have evaluated how many minutes of transport traverse each of its cross sections
8 (transport between any two wire centers) and used these minutes to weight the mileages
9 between these same cross sections. By doing this Verizon-MA would have developed
10 a weighted average distance based on the number of minutes traversing its switched
11 network.

Q. DID VERIZON-MA USE THIS TYPE OF APPROACH TO DEVELOP ITS AVERAGE DISTANCE FOR COMMON TRANSPORT?

A. No. There is no information on precisely how Verizon-MA developed the distance.

Verizon acknowledges that the common transport is to include the distances between

"end offices or from an end office to a tandem." However, Verizon claims that its

distance is *only* based on where the CLEC interconnects and does not consider the

total demand for common transport in its network. Common transport, however, is

also used with the UNE-Platform and the usage of this element would not be based on

where the CLEC interconnected, but rather, would be based generally on common

transport between any two Verizon central offices for Verizon's own usage.

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Workpaper Part C-2, Common Transport Cost Study Documentation File, Section 1.1.

²² *Id*.

Nonetheless, the distance according to how Verizon-MA developed it is 37.52 miles for local.²³ The problem with this approach is that most common transport actually traverses between two end offices where the mileage will be much shorter than 37.52 miles. In Verizon-MA's development of common transport, Verizon-MA did not account for this shorter distance. Verizon's approach is not valid.

6 Q. DO YOU HAVE ENOUGH INFORMATION TO RESTATE VERIZON-MA'S DISTANCES?

A. No. However, based on experience from doing these types of studies in other jurisdictions, I believe a more appropriate distance that accounts for both the common transport mileage between end offices as well as the common transport distance between and end office and a tandem is approximately 12 miles. While this mileage cannot be precisely supported from Verizon-MA data because I do not have it available, it is clearly a more appropriate distance than the 37.52 miles Verizon-MA has used based *only* on traffic related to interconnection with its network.

Q. DID THIS SAME ISSUE ALSO ARISE IN NEW YORK?

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16 A. Yes. In New York, Verizon was using a distance of 33.4 miles. However, in this case,
17 Verizon calculated the distance assuming that common transport would always be
18 between one of its end offices and *only* one of its tandems. Interestingly, the distance in
19 Massachusetts is even longer raising the possibility that Verizon actually made the same
20 error in Massachusetts, but simply did not describe it as so. Nonetheless, the New

Workpaper Part C-2, MA DTE 01-20 Common Transport, Section 3, Line 5.

1		York proposed decision recommended using the 12 miles that I have proposed in this
2		testimony and also proposed in New York.
3 4 5	Q.	COULD YOU PLEASE SUMMARIZE THE RESULTING RATES FOR COMMON TRANSPORT BASED ON YOUR MODIFICATIONS TO VERIZON-MA'S COST STUDY?
6	A.	Yes. The resulting rate for common transport is \$0.000091 per minute of use. Please
7		note that this resulting rate also reflects adjustments to the annual cost factors and
8		overhead factors that are addressed in other sections of this reply testimony.
9 10	Q.	DOES THIS MODIFIED COMMON TRANSPORT RATE AFFECT ANY OTHER RATE ELEMENTS PROPOSED BY VERIZON-MA?
11	A.	Yes. Verizon-MA has proposed a rate element, the Unbundled Common Transport
12		Charge ("UCTC") that is the weighted average combination of two different unbundled
13		elements: common transport and tandem switching. The Department should be aware
14		that to the extent that it modifies the common transport element (or the tandem switching
15		element), the UCTC would also have to be modified. Additionally, to the extent that
16		any reciprocal compensation elements rely on common transport, the rates for these
17		elements will need to be modified as well to maintain internal consistency between the
18		rate elements.
19	V.	VERIZON-MA'S CLAIMED COLLOCATION COSTS
20 21	Q.	THERE ARE NUMEROUS RATE ELEMENTS ASSOCIATED WITH COLLOCATION. WILL YOUR TESTIMONY ADDRESS ALL OF THEM?
22	A.	No.
23 24	Q.	HOW THEN HAVE YOU PRIORITIZED YOUR CRITIQUE OF VERIZON-MA'S COLLOCATION COST STUDY?

1	A.	I have prepared a one-page analysis to identify the important gaps between the present
2		approved rates for collocation in Massachusetts and the new proposed rates that
3		Verizon-MA sets forth in its cost study.

- 4 Q. HOW DID YOU IDENTIFY THE IMPORTANT GAPS BETWEEN THE
 5 CURRENT RATES IN THE STATE TARIFF AND VERIZON-MA'S COST
 6 STUDY?
- 7 A. First, I developed a prototype collocation arrangement that a CLEC would order from Verizon-MA, and calculated the amount the CLEC would be charged for such an 8 9 arrangement, both under Verizon-MA's proposed rates and under those currently listed 10 in the existing Verizon-MA state collocation tariff. The primary purpose of this 11 prototype is simply to apply the rate elements in a "real-world" collocation scenario to allow comparison of the effect of Verizon-MA's proposed collocation rates on the total 12 13 cost of collocation. So, for instance, even though Verizon-MA has proposed nonrecurring charges for collocation planning of \$4,126.27 and the present state 14 15 collocation tariff does not contain these charges for physical caged collocation, this discrepancy only accounts for 3.07 percent of the gap between Verizon-MA's 16 17 proposed rates and those that are currently contained in the tariff for a typical collocation. 18

Second, once I had developed the comparative rates for the prototype collocation arrangement, I calculated the net present value over a seven-year period to

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account for both the nonrecurring and recurring aspects of collocation rates from a total rate perspective.²⁴

Third, I compared those elements where Verizon-MA's purported costs are higher than those found in the present collocation tariff to identify the primary discrepancies. The gaps were calculated based on net present value comparisons for the prototype collocation – not based on the rate element by itself. This analysis yielded the gaps for the rate element categories identified below for physical caged collocation. The table below summarizes the results of the analysis, and the full analysis can be found in Attachment SET-2.

The seven-year period was selected to allow for combining the net present value effects of both the nonrecurring and recurring charges into a single cost. The choice of seven years is a reasonable period for evaluating a collocation business plan. However, if I had chosen a much longer period, the effect of the recurring charges in the total net present value would have become so significant as to overwhelm the effect of the nonrecurring charges in the total. The reverse holds true if I had selected a much shorter time period – the nonrecurring effect would have overwhelmed the recurring effect. In short, I selected seven years to attempt to balance the impact of both nonrecurring and recurring charges in the resulting net present value.

There are additional forms of collocation other than physical caged collocation and a similar analysis could have been conducted for these as well. However, the nature of the changes made by Verizon-MA cause virtually all of the impact on collocation rates to be felt in one area – DC power. This rate element category affects all forms of collocation within the central office. As such, while I did not evaluate the comparisons for all of the forms of collocation, this analysis indicates that this Commission's focus needs to be squarely on DC power for all forms of collocation.

Rate Element	Gap Percentage
Planning/Engineering	3.07
Cage Preparation (Including POT Bay)	2.76
Land & Building (Including POT Bay)	24.10
Cable Racking	0.00^{26}
DC Power Delivery	27.77
DC Power Consumption	42.29
Voice Grade Circuits	0.00
DS1 Circuits	0.00
DS3 Circuits	0.00
Security Access	0.00
Entrance Fiber Structure Charge	0.00
Total	100.00

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Q. WHAT PRIORITIES DID YOU CONCLUDE FROM THIS ANALYSIS?

3 A. There are three rate elements that should be addressed in the following sections of testimony that in many cases cross multiple forms of collocation and represent significant 4 5 gaps between the current collocation tariff in Massachusetts and Verizon-MA's proposed costs: (1) Land and Building; (2) DC Power Delivery; and (3) DC Power 6 7 Consumption. These three elements alone account for 94.17 percent of the gap between the present costs in Massachusetts and what Verizon-MA is proposing. As I 8 will demonstrate below, Verizon-MA's proposed costs for these elements are not cost 9 based nor are they even within reason when compared to cost filings across the country 10 particularly related to DC power. 11

Q. ARE THESE THE ONLY ISSUES THAT YOU BELIEVE THE DEPARTMENT SHOULD BE CONCERNED WITH IN THIS PROCEEDING RELATED TO COLLOCATION?

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An entry of 0.00 percent in this table does not indicate that the present collocation tariff and Verizon-MA's proposed are the same. Rather, it indicates that the Verizon-MA purported cost is lower than the present tariff or so close that there is no gap between the two costs that this Commission must address.

1 A. No. Verizon-MA has introduced *significant* changes to the manner in which it wants 2 to recover the cost for interconnection arrangements, i.e., changes in rate structure 3 and application. Verizon has generally maintained or slightly lowered the cost estimate 4 for each element. However, Verizon proposes to apply the rate elements in such a way as to significantly increase the revenues that it will obtain from the same collocation 5 arrangements. Moreover, Verizon has introduced a significantly different cost recovery 6 structure and mechanism without even mentioning how it plans to transition into this rate 7 8 structure. My testimony will also address this concern in that it is vital that transition 9 issues be addressed. If the transition to a new rate structure is not handled appropriately, it will produce windfall profits for Verizon by generating extraordinary 10 revenues that are not associated with any cost that Verizon actually incurs. 11

A. Land and Building

- 13 Q. WHAT IS THE DIFFERENCE BETWEEN THE LAND AND BUILDING
 14 RATE IN THE PRESENT COLLOCATION TARIFF VERSUS WHAT
 15 VERIZON IS PROPOSING IN THIS PROCEEDING?
- In the present collocation tariff, Verizon charges \$2.21 per square foot for space within its central offices. It does not charge an additional rate for the POT frame. Verizon is now proposing a rate of \$4.02 per square foot for space within its central offices (an extra \$1.81 per square foot) plus an additional \$28.14 for the POT frame. This Land and Building rate is an increase of 81.9 percent over what is currently approved in the tariff.
- 22 Q. HAS VERIZON SUBSTANTIATED WHY SUCH A SIGNIFICANT INCREASE IS WARRANTED.

No. Verizon has indicated in responses to AT&T Information Request No. 5-1 that there are four primary reasons why the cost has increased.²⁷ First, it notes that in the 1998 compliance filing for the Land and Building rate in the current tariff that no land cost was included in the \$2.21 rate. In discovery, I asked Verizon to provide the information supporting the current tariff rate and explain why there was a significant increase in the rate. Verizon did not provide a complete set of documentation from the 1998 compliance filing (it only provided the investment data – not how the investment data were converted into a recurring rate); nevertheless, it does appear from what was provided that the land investment was not included in the \$2.21 rate. Second, Verizon notes that the annual cost factor that is now being used for building investment has increased from 0.2951 to 0.4108 – an increase of 39.2 percent. *Third*, Verizon indicates that the 1998 compliance filing did not include the common cost factor or the gross revenue loading in the final rate of \$2.21 per square foot. Again, I had asked Verizon to provide the cost filing that would support these types of differences and on the question of factor application, Verizon did not provide this information. The only information that Verizon provided was support for the investments used in the study. As such, Verizon did not demonstrate that the common cost factor and gross revenue loading were not included in the 1998 compliance filing. Fourth, Verizon provided information showing the difference in building investment that it was claiming for the present study as compared to the 1998 study. Regarding this last change, Verizon-MA

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Verizon New England Inc. d/b/a Verizon Massachusetts, Commonwealth of Massachusetts DTE 01-20 (Part A), Response to AT&T Communications of New England Information Requests Set No. 5, Item 5-1. (Hereafter noted as Verizon Response to AT&T Information Request No. 5-1.)

did not indicate that the 1998 building investments were incorrect. Verizon-MA simply indicated that it would be using the 2001 building investments from its database without any explanation. These are the only four changes that Verizon-MA indicated were applicable to explaining the cost difference between the tariff and the proposed increase in the Land and Building rate.

A.

Q. COULD YOU PLEASE GO THROUGH THESE FOUR CHANGES AND IDENTIFY HOW MUCH DIFFERENCE IN THE RATE IS ATTRIBUTABLE TO EACH?

Yes. *First*, according to Verizon's cost study, the land investment adds only \$0.08 per month to the recurring rate for the Land and Building rate element. In other words, if Verizon's main concern had been that the present rate for Land and Building was missing the Land cost, then the new rate would have increased from \$2.21 up to \$2.29 to account for this missing investment.

Second, according to Verizon, the annual cost factor used in the 1998 compliance filing for building investment was 0.2951. The annual cost factor used in the cost filing for Verizon's cost study in this proceeding is 0.4108. This change in the annual cost factor would have caused the \$2.21 per square foot in the current tariff to increase to \$3.08 – an increase of \$0.87.

Third, Verizon claims that the common cost and gross revenue loading factors were left out of the 1998 compliance filing. If they had been applied to the \$2.21 cost per square foot cost as Verizon filed in 1998, the rate would have changed to \$2.39 – an increase of \$0.18. However, because of the annual cost factor change Verizon is claiming, the actual difference attributed to this change is actually \$0.19.

1		Fourth, the final area that Verizon has adjusted is the building investment itself.
2		These building investment changes account for \$0.67 of the \$1.81 difference in the per
3		square foot rate between 1998 and 2001.
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4 Q. COULD YOU COMMENT ON WHETHER YOU SUPPORT EACH OF 5 THESE FOUR CHANGES TO VERIZON'S LAND AND BUILDING RATE?

A.

First, I have already indicated that it appears that the 1998 compliance filing did not include land investment in the final Land and Building rate. In my opinion, land investment should be recovered through the Land and Building rate element and the land investment that Verizon has requested here is appropriate. I will comment on the factors applied to this investment below.

Second, Verizon has claimed that the annual cost factor for building investment should be increased from 0.2951 to 0.4108. This is an excessive increase and not based on cost. Michael R. Baranowski documents the changes that AT&T and WorldCom propose to correct Verizon's cost factors including the building cost factor. The building annual cost factor that AT&T and WorldCom propose in this proceeding is 0.3141 and in light of the fact that Verizon has not supported the 39.2 percent increase in this factor, the AT&T factor should be used.

Third, I cannot speak to whether the common cost and gross revenue loading factors were left out of the 1998 compliance filing or not. However, I believe there is little disagreement as to whether they should be applied, and my proposed rates that will follow in this discussion will include both factors adjusted to the level proposed by AT&T and WorldCom in this proceeding.

Fourth, Verizon has modified the building investment calculations significantly in developing its new Land and Building rate for this proceeding. I have carefully reviewed these changes evaluating on a central office by central office basis the types of changes that Verizon has made to the calculations. My assessment is that the nature of the changes that Verizon has made are so unsupportable that the Department should reject them completely and instead use the building investments Verizon included in the 1998 cost filing.

Q. COULD YOU PLEASE EXPLAIN THE NATURE OF THE PROBLEMS WITH VERIZON'S REVISED BUILDING INVESTMENTS?

A.

Yes. There are two important elements in developing the building investment per square foot: (1) the actual investment in the building and (2) the assignable square feet of space over which that investment is spread. I compared the investments and assignable square feet contained in Verizon's 1998 study to those found in the 2001 cost study and found numerous inconsistencies. *First*, I found numerous instances where Verizon showed significant increases in the investment for the building, but the assignable space within the building did not change or only increased slightly. For example, in 1998, Verizon showed the Sharon central office as having a building investment of \$449,475.48 and assignable space of 5,001 square feet.²⁸ However, in 2001, Verizon shows the Sharon central office as having a building investment of \$958,977.78 and assignable space still of 5,001 square feet.²⁹ In other words, Verizon increased the

Verizon Response to AT&T Information Request No. 5-1, Attachment 1.

Verizon Response to AT&T Information Request No. 5-1, Attachment 2.

investment in this building by 113.4 percent but gained no assignable space in the process. Given that this is a central office, this absolutely should not happen in that building investment, particularly of this magnitude, should be adding to the assignable space. Also note that the investment per square foot for this building increased from \$89.88 to \$191.76. If the \$89.88 per square foot for this building represents a TELRIC investment from 1998, there is no way that the \$191.76 from 2001 for the same building can also be based on TELRIC. This is not the only example of this situation happening in Verizon's cost study. There are numerous situations, but for brevity, I will provide only one more. In 1998, Verizon showed the Tewksbury central office as having a building investment of \$617,297.81 and assignable space of 6,432 square feet.³⁰ However, in 2001, Verizon shows the Tewksbury central office as having a building investment of \$988,725.51 and assignable space of 6,638 square feet.³¹ In other words, Verizon increased the investment in this building by 60.2 percent but only gained 3.2 percent in space within the central office.

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TELRIC requires that the cost be developed from a total demand perspective and not from an augment perspective. In 1998, Verizon's building investment in Tewksbury was \$95.97 per square foot. Between 1998 and 2001, however, Verizon augmented the space at a cost of \$1,803.05 per square foot. If the \$95.57 per square foot for this building represents a TELRIC investment from 1998, there is no way that a CLEC should then pay for the \$1,803.05 per square foot augment that Verizon then

Verizon Response to AT&T Information Request No. 5-1, Attachment 1.

Verizon Response to AT&T Information Request No. 5-1, Attachment 2.

included. In short, data from central offices that fall into this category should not be used for developing the Land and Building rate in 2001.

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Second, I noted that there were numerous situations where Verizon showed significant increases in the investment for the building, but the assignable space within the building actually decreased. For example, in 1998, Verizon showed the Chelmsford central office as having a building investment of \$596,799.51 and assignable space of 7,380 square feet.³² However, in 2001, Verizon shows the Chelmsford central office as having a building investment of \$1,166,553.84 and assignable space of 7,166 square feet.³³ In other words, Verizon increased the investment in this building by 95.5 percent but *lost* 214 square feet of assignable space in the process. Given that this is a central office, this absolutely should not happen in that building investment, particularly of this magnitude should be adding to the assignable space, not subtracting from it. Also note that the investment per square foot for this building increased from \$80.87 to \$162.79. If the \$80.87 per square foot for this building represents a TELRIC investment from 1998, there is no way that the \$162.79 from 2001 for the same building can also be based on TELRIC. This is not the only example of significant increases in building investment with accompanying decreases in assignable space. There are numerous instances in Verizon's cost study, but for brevity, I will provide only one more. In 1998, Verizon showed the Gloucester central office as having a building investment of

Verizon Response to AT&T Information Request No. 5-1, Attachment 1.

Verizon Response to AT&T Information Request No. 5-1, Attachment 2.

\$664,360.68 and assignable space of 11,386 square feet.³⁴ However, in 2001, Verizon shows the Gloucester central office as having a building investment of \$1,213,530.86 and assignable space of 11,288 square feet.³⁵ In other words, Verizon increased the investment in this building by 82.7 percent but *lost* 98 square feet of assignable space in the process. Again note that the investment per square foot for this building increased from \$58.35 to \$107.51. If the \$58.35 per square foot for this building represents a TELRIC investment from 1998, there is no way that the \$107.51 from 2001 for the same building can also be based on TELRIC. Please understand, too, that I have not tried to find the worst examples of Verizon making these types of changes in the building investment in my testimony – there may be worse ones. These examples merely reflect what has occurred throughout Verizon's cost study.

Third, I noted that there were numerous situations where the investment did not change substantially for the central office, but the assignable space within the building decreased. I will not include examples here in that they are similar in nature to those described immediately above. Moreover, it is simply not appropriate in a central office environment for assignable space to be lost within central offices given that the purpose for constructing the space in the first place was to house telecommunications equipment.

Fully, 121 of the 196 central offices (or 61.7 percent) that Verizon used in its 1998 cost study that are also used in the 2001 cost study have these types of problems with the building investment and assignable square footage. These problems are of such

Verizon Response to AT&T Information Request No. 5-1, Attachment 1.

Verizon Response to AT&T Information Request No. 5-1, Attachment 2.

a scale that it is not possible to "correct" the 2001 study. Moreover, the problems are so comprehensive, that these inconsistencies are not isolated instances that can be corrected. Instead, the most prudent approach is to use the data from the 1998 filing because this Department has already approved the 1998 costs.

5 Q. COULD YOU PLEASE SUMMARIZE YOUR RECOMMENDATIONS FOR 6 THE DEPARTMENT WITH REGARD TO THE LAND AND BUILDING 7 RATE ELEMENT?

A. Yes. Quite simply, I would recommend that the Department use Verizon's building investment from 1998 along with the land investment that it believes was excluded in the 1998 cost study. Further, I would recommend that an annual cost factor of 0.3141 be applied to the building investment and an annual cost factor of 0.2097 be applied to the land investment. Finally, I would recommend that the common cost factor of 0.0463 and Verizon's gross revenue loading factor be added to develop the final rate. The resulting rate from the above calculations leads to a rate of 2.52 per square foot, which is still higher than the current tariff rate, but does not include the unreasonable increases in building investment and cost factors that Verizon is proposing.

B. DC Power

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- 18 Q. BEFORE YOU BEGIN YOUR CRITIQUE OF VERIZON'S DC POWER
 19 COSTS, COULD YOU FIRST START BY EXPLAINING WHAT THE MAIN
 20 ELEMENTS OF DC POWER ARE?
- A. Yes. DC Power is comprised of two main elements: DC Power Distribution and DC
 Power Consumption. DC Power Distribution is the rate element that recovers the costs
 for the DC power cabling that is extended from Verizon's Battery Distribution Fuse Bay

 ("BDFB") to the collocation arrangements. This DC power cabling consists of pairs of

copper cables in protective sheaths to complete a power circuit from the BDFB to the collocation arrangement – one part of this pair representing the "battery" or delivery of power and the other part of this pair representing the "ground" or return of the power. Moreover, this pair normally comes in matching pairs for redundancy where one pair will be referred to as the "A-side" power feed and the redundant pair referred to as the "B-side" power feed so that if one side fails, power will not be completely cut off to the telecommunications equipment. Finally, the BDFB is simply a large fuse bay or junction point where a large feed of DC power from the power plant is broken down into smaller increments of power. This piece of equipment is necessary because it allows for the cables from the BDFB to the collocation arrangement (or Verizon telecommunications equipment, for that matter) to be much smaller and therefore less expensive (which are many in number) as a tradeoff to large power cables from the power plant to the BDFB which are more expensive (but much fewer in number). The cables from the BDFB to the collocation arrangement are captured in the DC Power Distribution element. The BDFB itself is recovered in DC Power Consumption discussed below.

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DC Power Consumption gives the connotation that something is being used up, but for the vast majority of the DC Power Consumption cost, this is a misnomer.

Virtually all of the cost for DC Power Consumption is recovering the cost of the equipment necessary to generate DC power. (In electricity regulation, this is the "capacity" component.) Virtually all telecommunications equipment operates on DC power (or direct current power), whereas the power that can be purchased from the

electric utility is AC power (or alternating current power). A whole series of equipment must be installed by Verizon to convert this AC power to DC power and provide for its redundancy: rectifiers (which actually convert the AC power to DC power); batteries (which stabilize the DC power and provide for short-term backup in the event of an AC power failure); controllers and power distribution service cabinets (for managing the DC power elements and distributing the power throughout the central office); and the emergency engine (for providing long-term backup in the event of a lengthy AC power failure). The cost recovery of these elements constitutes the vast majority of the cost in DC Power Delivery and none of these elements is actually "consumed." However, they are necessary to provide the DC power that is used by the telecommunications equipment. The part of DC Power Delivery that is consumed is the AC power that is purchased from the electric utility that is then converted into DC power. This part of the DC Power Consumption element, however, is a small part of the overall cost.

A.

Q. GIVEN THIS BACKGROUND, COULD YOU PLEASE OUTLINE WHAT THE MAIN CONCERNS ARE WITH VERIZON'S PROPOSED COSTS FOR DC POWER?

Yes. However, before I list the detailed problems with Verizon's cost study, I believe it is important to first step back and understand how extraordinary Verizon's proposed rates are for DC power when contrasted with much of the remainder of the country. There are two reasons why this perspective is so important. *First*, if Verizon's purported costs are significantly out of line with those of other incumbents across the country, then I believe it is only appropriate that Verizon provide a much more thorough documentation of why it believes its significantly higher costs are appropriate. In this

1 regard, Verizon has completely failed in its responsibilities to demonstrate that its DC 2 power costs are cost based both in its affirmative filing of its case and in its response to extensive discovery on DC power by myself and other parties. I believe it is important 3 4 for the Department to be aware of this difference in costs so that the Department will likewise recognize the importance of substantial support for these costs from Verizon. 5 Second, the focus of my testimony is targeted at DC power costs. I have done this 6 7 because most of Verizon's costs (except for Land and Building, which was discussed 8 earlier) are generally consistent with cost-based rates. However, I think that the 9 Department needs to understand how significant the gap is with DC power for Verizon. The fact that many of Verizon's collocation cost elements are reasonable should not 10 cause the Department to fail to see how significantly out of balance Verizon's DC 11 12 power costs are. Q. COULD YOU PLEASE PROVIDE YOUR GENERAL COMPARISON OF 13 **VERIZON'S DC POWER COSTS TO THOSE OF OTHER INCUMBENTS?** 14 Yes. Verizon is asking for the Department to approve a DC Power Consumption rate A. 15

of \$22.79 per amp. Please note the following states' DC Power Consumption rates

and the percent gap between Massachusetts and these states:

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State	DC Power Consumption Rate	Verizon-MA Gap
Texas	\$9.50	240%
Kansas	\$7.57	301%
Oklahoma	\$7.28	313%
Michigan	\$9.65	236%
Alabama	\$13.50	169%
Florida	\$13.29	171%
Georgia	\$7.50	304%
Kentucky	\$13.16	173%
Louisiana	\$13.80	165%
Mississippi	\$13.44	170%
North Carolina	\$9.98	228%
South Carolina	\$13.79	165%
Tennessee	\$13.31	171%

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Please note that I could add other states that do not have completed collocation cost proceedings and actually compare Verizon to what these other incumbents are *requesting* (not what the Department has or will *order*) and even these comparisons would be compelling because most incumbents other than Verizon do not even request power rates as high as the rates that Verizon is asking the Department to approve in Massachusetts. Again, the point for the Department to take away from this comparison is that, in Massachusetts, Verizon is asking for the Department to approve a DC Power Consumption rate that is anywhere from 165 to 304 percent above the rates that other states have found to be cost based. If Verizon is to be permitted to have such an exceedingly higher rate in Massachusetts, then I believe it should have to present a compelling case that Massachusetts is a special case when compared to DC Power Consumption elements across the country that recover the cost for the same DC Power Consumption investment elements as in Massachusetts.

1	Q.	ARE THERE ANY VERIZON STATES OUTSIDE OF VERIZON-EAST
2		THAT HAVE FINALIZED DC POWER RATES OF WHICH THE
3		DEPARTMENT SHOULD BE AWARE?

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Yes. Verizon recently completed a settlement for DC Power Consumption (and other collocation elements) in Nevada that provides an interesting comparison to DC Power Consumption elements in Massachusetts. Specifically, the settled rate for DC Power Consumption in Nevada is \$15.12 per amp. This leads to a 151 percent gap when calculated consistent with the table displayed above. However, the gap between Verizon-Nevada and Verizon-Massachusetts is actually much more significant when the profile of Verizon-Nevada's offices is taken into account. Specifically, the offices in Verizon-Nevada territory would best be described as rural offices when compared to those that are found in Verizon's Massachusetts cost study. As such, the comparison of \$15.12 versus \$22.79 is not appropriate. Instead, a comparison of Verizon-Nevada against Verizon-Massachusetts for rural offices should be done. This can easily be done in Verizon-MA's cost study by changing the "Statewide Weighting Factor" so that rural offices account for 100 percent of the offices in Massachusetts. When this is done, the Verizon-MA rural proposed rate for DC Power Consumption is \$33.75 as compared to Verizon-NV's settled rate for DC Power Consumption of \$15.12. In other words, the real gap is 123 percent.

Now, if one were to reverse this process and assume that if Verizon believes that rural offices actually have a cost of \$15.12 per amp and extrapolate to what the cost would be for the entire state of Massachusetts, the rate in Massachusetts would be \$10.21 per amp. Please note that this rate is not significantly different from the rate that

the Texas Public Utilities Commission recently ordered for Texas after conducting an extremely detailed evaluation of Southwestern Bell's costs for collocation.

A.

Again, my main purpose in reviewing this information is so that the Department has a better understanding of how inconsistent Verizon's costs for DC Power Consumption are when compared to other similar incumbents – including comparing to what Verizon has settled for in another of its states. Consequently, in light of the significant disparity in cost that Verizon is seeking approval for, Verizon should be required to provide considerable support for its higher costs.

Q. HAVE YOU FOUND THAT VERIZON HAS PROVIDED THE TYPE OF SUPPORT NECESSARY TO JUSTIFY THESE SIGNIFICANTLY HIGHER COSTS?

Absolutely not. *First*, in Verizon's affirmative filing of its cost study, it provided literally no support for the costs that are contained in its DC Power cost study simply asserting that critical input values were provided by "engineering." As a result, AT&T and other parties asked a series of questions seeking the backup documentation to support the costs that Verizon claimed in its cost study. Verizon in many instances has simply not provided information that is responsive to the information requests. In other instances, Verizon has provided data, but not data that support its purported costs. Throughout Verizon's supposed support for its DC power plant investment data, there is virtually no correspondence between the investments and the support that is shown from the invoices. In short, even through the discovery process, Verizon has wholly failed in

Physical Collocation, Verizon Massachusetts, WP 5.0, Page 1 – DC Power per Amp.

1		providing the necessary support for its DC Power Delivery costs, even though this was
2		almost exclusively the only area where AT&T's questions were directed.
3	Q.	NOTWITHSTANDING THE LIMITED COST SUPPORT PROVIDED BY
4		VERIZON, COULD YOU PLEASE IDENTIFY THE AREAS OF VERIZON'S
5		COST STUDY THAT YOU BELIEVE TO BE INCONSISTENT WITH
6		TELRIC COST PRINCIPLES?
7	A.	Yes. There are essentially four areas that represent significant problems in Verizon's
8		costs for DC Power:
9		1. Verizon has utilized a power installation factor that is purportedly based on
10		its installation of electronic switching jobs that significantly overstates the
11		installation cost associated with power jobs.
12		2. Verizon's Emergency Engine Investment significantly overstates the cost per
13		amp for this element primarily by using emergency engine sizing that is not
14		based on total demand as required by TELRIC thereby precluding
15		collocators from experiencing the economies of scale Verizon itself enjoys
16		for this investment.
17		3. Verizon has used digital switching annual cost factors to develop the costs
18		for DC Power even though the DC power investment is used for both
19		switching and transport in Verizon's central offices and is used almost
20		exclusively for transport in collocation arrangements.
21		4. Verizon has used distances in developing the DC Power Distribution costs
22		that are discriminatory against CLECs and inconsistent with efficient
23		engineering practices for the deployment of BDFBs within central offices.
24		Please understand that there are other problems with Verizon's cost study. For
25		instance, Verizon has provided virtually no support for its material costs in its cost study
26		even though it was directly asked for this in discovery. ³⁷ Nonetheless, my review of the

Verizon provided a response to AT&T Information Request No. 5-4 that provided the invoices for the material costs for DC Power in Massachusetts. However, there was virtually no correlation to the actual investment values that Verizon is using in its cost study. It almost appeared as if Verizon was providing some invoices for power jobs in Massachusetts, but had no support for the actual values used in its cost study.

material costs for Verizon's DC Power cost study does not show this to be the problem other than for the emergency engine. My focus is on where the significant gaps are between Verizon's cost study and what TELRIC principles would indicate its costs should be.

1. Concerns with the DC Power Installation Factor

Q. PLEASE EXPLAIN WHAT VERIZON'S DC POWER INSTALLATION FACTOR IS AND HOW IT WAS DEVELOPED.

A.

A.

First, based on the approach Verizon has taken in its cost study, it has chosen to apply installation factors to the material cost for DC power investments to develop the total installed costs. In other words, instead of using the actual labor costs and miscellaneous costs associated with installing DC power components, Verizon has instead chosen to estimate this cost using an installation factor. Second, according to Verizon's response to WorldCom Information Request No. 2-8, Verizon has based the installation factor of DC power equipment off of the installation factor Verizon has derived for installation of electronic switching equipment.

O. WHAT ARE YOUR CONCERNS WITH THIS APPROACH BY VERIZON?

There are at least three problems with this approach. *First*, digital switching equipment and the installation activity associated with this equipment does not even begin to compare with the installation activity associated with DC power equipment in terms of the complexity and testing associated with switching as compared with relatively simpler DC power equipment. Therefore, multiplying by an overstated installation factor assigns an unrealistically high cost to installing power equipment. However, this is only the

beginning of the problem here. The factor is a ratio of material costs to total installed costs. There is no way for Verizon to substantiate that the ratio between material and total installed cost that it believes is appropriate for electronic switching equipment is the same ratio that is appropriate for DC power equipment. Moreover, based on my experience with these costs, these ratios are totally unrelated.

Second, factors for grossing up material costs into total installed costs would make sense if it were difficult to identify the installation and miscellaneous costs associated with the DC power installation jobs. However, it is extremely easy to obtain this information. Vendors, such as Lucent, the DC power equipment supplier that Verizon cited in its response to AT&T Request No. 5-4, are fully capable of providing not only the material cost for installation jobs that it supplies, but can also provide the installation costs, and other miscellaneous costs, if any, associated with the job. I have personally seen this level of detail for Lucent projects. Moreover, later in this testimony, I will provide information for an AT&T job with Lucent where precisely this type of information is available. Further, in Pennsylvania, Verizon provided this type of information in response to discovery questions, so it is clear that Verizon also has this type of information.

AT&T attempted to obtain this type of information from Verizon in Massachusetts as well so that the installation cost could be based on the actual installation of DC power equipment, rather than estimated on the installation of

1	electronic switching equipment. However, Verizon did not provide this information. ³⁸
2	Again, this information is available to Verizon. Verizon provided this type of information
3	in Pennsylvania. Finally, this type of data should be used, when available, rather than
4	factors that have no real relation to the type of work being conducted.

Third, application of the factor that Verizon has used – 2.7852 – does not produce a result that is even close to the installed costs that I have observed in DC power installation projects. This will be fully illustrated later when I discuss the AT&T installation project for two DC power plants in Pennsylvania.

Q. IS THERE A WAY TO CORRECT THIS FACTOR BASED ON INFORMATION THAT HAS BEEN PROVIDED BY VERIZON?

11 A. No. Verizon has carefully avoided providing any data that would allow me to correct
12 this factor based on Verizon-specific data in Massachusetts. As I indicated above, I
13 was able to make these types of adjustments in Pennsylvania because Verizon at least
14 provided this type of information in response to discovery. However, Verizon has
15 effectively refused to provide this data in Massachusetts.

Q. WHAT INSTALLATION FACTOR WOULD YOU RECOMMEND IF THE DEPARTMENT WERE TO MAINTAIN THIS APPROACH FOR DEVELOPING DC POWER COSTS IN MASSACHUSETTS?

A. Obviously, the best approach is to identify the installation cost associated with the material being installed and to base this cost on the installation of a complete DC power

AT&T Information Request No. 5-6. Please note that the information request asked for "actual invoices" to support the installation factor that Verizon proposed for DC power equipment. Verizon did not provide invoices, but instead supplied its DCPR spreadsheet for switching equipment. In short, this spreadsheet was simply unresponsive to the information asked for in the information request and does not satisfy the need for Verizon to support the installation factor that it is recommending in this proceeding.

1	plant – not an augment – so that the cost is based on TELRIC principles. Consistent
2	with this approach, and consistent with the data that will be discussed in more detail
3	below from AT&T's own installation of central office power plants, the installation
4	factor should be 1 454

5 Q. KEEPING EVERYTHING ELSE THE SAME, WHAT DOES THE USE OF THE 1.454 INSTALLATION FACTOR DO TO VERIZON'S COSTS FOR DC POWER CONSUMPTION?

A. This change alone brings Verizon's purported costs for DC Power Consumption from \$22.79 to \$11.90 per amp. This change alone accounts for virtually all of the difference between Verizon's view of DC power costs and those that I believe would be consistent with TELRIC.

2. Concerns with the Emergency Engine Investment

A.

Q. WHAT IS YOUR CONCERN WITH VERIZON'S EMERGENCY ENGINE INVESTMENT?

Quite simply, Verizon has not properly determined the DC power output from the emergency engine. The emergency turbine generates AC power for the central office in the event that the AC power feed from the utility is cut off. The emergency turbine must provide sufficient AC power to support the entire DC power plant, as well as providing sufficient power for emergency lighting and other electricity needs. This is where Verizon's cost estimate falls short. Specifically, Verizon's own cost data shows that for Metro offices, the DC power generation requirement is at least 3,200 amps (plus additional capacity should provide for auxiliary uses within the central office to bring this value to approximately 4,000 amps). However, Verizon only sized the power plant for

an emergency engine with a capacity of 1,505 amps. As such, the emergency engine is significantly undersized and therefore the economies of scale that would exist if a properly sized emergency engine had been assumed are not flowing through to the collocators – economies of scale that Verizon would in reality enjoy. The table below summarizes the capacity required for each of the four central office classes and the capacity Verizon erroneously included instead.

Office Class	Capacity Required (in Amps)	Capacity with Ancillary Needs (in Amps)	Verizon Capacity (in Amps)
Metro	3,200	4,000	1,505
Urban	1,400	1,750	1,216
Suburban	1,400	1,750	696
Rural	400	500	278

A.

As can be seen, Verizon has undersized the capacity of its emergency engine across all four office categories thereby denying collocators the benefits of the economies of scale that Verizon would have actually deployed in each of these four classes of office.

Q. HOW DID YOU DEVELOP VERIZON'S CAPACITY REQUIREMENT?

In Verizon's cost study, it has denoted the rectifier capacity for each of the four classes of central offices. I simply took this capacity and also accounted for the utilization level that Verizon anticipated for these rectifiers. Prudence requires Verizon to include sufficient emergency engine capacity to support the deployment of rectifiers in the central office. Additionally, I have assumed that the telecommunications equipment consumes approximately 80 percent of the capacity that is actually needed in the backup generator and that the ancillary equipment and other electrical needs would

1		consume the remaining capacity. The 80 percent factor is based on my experience with
2		electrical usage within typical central offices.
3 4 5	Q.	ARE YOU ABLE TO CORRECT FOR VERIZON'S ERROR OF NOT USING THE TELRIC SIZING FOR THE BACKUP GENERATORS IN MASSACHUSETTS?
6	A.	Yes, but not with the precision I would like. In other states where I have reviewed
7		Verizon cost studies, Verizon has provided a comprehensive listing of emergency engine
8		investments for larger size emergency engines. Verizon has not done that here and as
9		such I cannot recalculate the appropriate cost per amp for these items. Nonetheless, I
10		will approximate a correction for this element in a comprehensive restatement of
11		Verizon's cost study that will be attached to my testimony.
12		3. Concerns with the Digital Switching Annual Cost Factors
		5. Concerns with the Digital Switching Annual Cost I actors
13 14 15	Q.	WHAT ARE YOUR CONCERNS WITH VERIZON'S USE OF DIGITAL SWITCHING ANNUAL COST FACTORS FOR DC POWER INVESTMENTS?
13 14	Q.	WHAT ARE YOUR CONCERNS WITH VERIZON'S USE OF DIGITAL SWITCHING ANNUAL COST FACTORS FOR DC POWER
13 14 15		WHAT ARE YOUR CONCERNS WITH VERIZON'S USE OF DIGITAL SWITCHING ANNUAL COST FACTORS FOR DC POWER INVESTMENTS?
13 14 15		WHAT ARE YOUR CONCERNS WITH VERIZON'S USE OF DIGITAL SWITCHING ANNUAL COST FACTORS FOR DC POWER INVESTMENTS? First note that I am not the annual cost factor witness for AT&T and WorldCom, so my
13 14 15 16		WHAT ARE YOUR CONCERNS WITH VERIZON'S USE OF DIGITAL SWITCHING ANNUAL COST FACTORS FOR DC POWER INVESTMENTS? First note that I am not the annual cost factor witness for AT&T and WorldCom, so my testimony in this regard does not address the actual level of the factors. This will be
13 14 15 16 17		WHAT ARE YOUR CONCERNS WITH VERIZON'S USE OF DIGITAL SWITCHING ANNUAL COST FACTORS FOR DC POWER INVESTMENTS? First note that I am not the annual cost factor witness for AT&T and WorldCom, so my testimony in this regard does not address the actual level of the factors. This will be addressed in the testimony of Michael R. Baranowski. However, my concern is that
13 14 15 16 17 18		WHAT ARE YOUR CONCERNS WITH VERIZON'S USE OF DIGITAL SWITCHING ANNUAL COST FACTORS FOR DC POWER INVESTMENTS? First note that I am not the annual cost factor witness for AT&T and WorldCom, so my testimony in this regard does not address the actual level of the factors. This will be addressed in the testimony of Michael R. Baranowski. However, my concern is that Verizon used the incorrect cost factor to develop the monthly recurring rate for the DC
13 14 15 16 17 18 19 20		WHAT ARE YOUR CONCERNS WITH VERIZON'S USE OF DIGITAL SWITCHING ANNUAL COST FACTORS FOR DC POWER INVESTMENTS? First note that I am not the annual cost factor witness for AT&T and WorldCom, so my testimony in this regard does not address the actual level of the factors. This will be addressed in the testimony of Michael R. Baranowski. However, my concern is that Verizon used the incorrect cost factor to develop the monthly recurring rate for the DC power investment. Verizon used the Digital Switch (Account 2212) Annual Cost

Typically, when the incumbent conducts a cost study for an unbundled element, the power investment that is used to support the asset being studied is included in the total investment for the element. As such, the power investment has the same ACF applied to it as would be applied to the underlying investment. In other words, if dedicated transport were being studied, the power investment supporting the dedicated transport elements would receive the circuit ACF; if unbundled switching were being studied, the power investment supporting the unbundled switching elements would receive the switching ACF.

A.

Collocation is somewhat different in that recurring rate for DC power is considered separately and there is no distinct ACF for DC power investment.

However, if the same principle discussed above for UNEs were applied to collocation, the circuit ACF should be used in that virtually all of the equipment that will receive DC power inside the collocation arrangement is circuit based.

Q. DOES VERIZON PROVIDE A BASIS FOR WHY IT USED THE SWITCHING ACF?

A. Yes. It argues that generally "power plants in Verizon MA's central offices are placed to support switching equipment," and therefore, that the switching ACF should be used.³⁹ The problem with this argument is that it is simply not true. Power plants are placed to support the entirety of the central office include switching equipment, transport equipment, peripheral equipment, and others – it is not just switching. Moreover, the factors that lead to the development of the annual cost factor such as depreciation life,

Verizon Response to AT&T Information Request No. 5-7.

1		maintenance cost, and the like lead to much lower costs than exist for switching,
2		because the depreciation life for power equipment is much longer than switching and
3		because the maintenance work for power equipment is much lower than the
4		maintenance work for switching. In short, it simply appears that Verizon selected the
5		higher of the two cost factors that could possibly be used without giving any attention to
6		how the power equipment is used or which factor more closely approximates its cost
7		structure. When these later two aspects are accounted for, the appropriate factor to
8		use is the transport ACF.
9 10	Q.	WHAT IS THE IMPACT ON THE DC POWER MONTHLY RECURRING RATE PER AMP FROM THIS CORRECTION?
11	A.	Making this correction reduces the DC power investment portion of the recurring rate
12		by 23.5 percent.
13		4. <u>Concerns with the DC Power Distribution Costs</u>
14 15	Q.	WHAT ARE YOUR CONCERNS WITH THE DC POWER DISTRIBUTION COSTS?
16	A.	There are essentially two concerns. First, Verizon has used the same digital switching
17		installation factor for DC Power Distribution Costs as it has for DC Power
18		Consumption with all of the same problems identified above. I will not repeat that
19		discussion here. However, to the extent that the Department modifies this factor for DC
20		Power Consumption, the same change should be made for DC Power Distribution.
21		Second, Verizon has used DC Power Distribution cabling distances that are inconsistent
22		with TELRIC principles.

Q. HOW HAS VERIZON DEVIATED FROM TELRIC PRINCIPLES IN REGARDS TO THE CABLING DISTANCES FOR DC POWER DISTRIBUTION?

A.

If you recall from my earlier discussion, the DC Power Delivery element recovers the costs associated with the cabling between the BDFB and the collocation arrangement. In general, central office engineering guidelines require that BDFBs be placed centrally to the equipment they serve. The reason for this is that DC power cables get geometrically more expensive the longer they are. As such, good engineering practice is to keep the cables from the BDFB to the telecommunications equipment as short as possible so that the cost of these cables is minimized.

Verizon has deviated from this practice in that the cabling distances that it assumes to develop the DC Power Distribution cost are significantly greater than what good engineering practice would call for. Specifically, in my experience, both in reviewing incumbent engineering documents in this area and in touring numerous incumbent central offices, the cabling distance between the BDFB and collocation arrangement (or incumbent telecommunications equipment) is approximately 45 feet. However, Verizon has regularly used distances that exceed this distance in its DC Power Distribution cost study. In the Metro zone, Verizon uses an average cabling distance of 121 feet. In the Rural zone, Verizon uses an average cabling distance of 80 feet. In the Suburban zone, Verizon uses an average cabling distance of 102 feet. Finally, in the Urban zone, Verizon uses an average cabling distance of 112 feet. In all cases, Verizon's cabling distance is significantly longer than that which is typical in efficiently engineered power cabling arrangements.

1 Q. HAVE YOU HAD THE OPPORTUNITY TO REVIEW VERIZON'S 2 ENGINEERING PRACTICE IN THIS SAME AREA TO CONFIRM THAT 3 IT IS THE SAME AS IN YOUR OTHER EXPERIENCE?

A. No. I tried to obtain this information via discovery in AT&T Information Request No.

5-9. However, Verizon did not provide the documents requested in this information

request.⁴⁰ I have obtained this type of documentation in other parts of the country and

know that it is normal for incumbents such as Verizon to have a "Bell System Practice"

that documents how DC power distribution is done generally in their network.

However, Verizon has not provided this information.

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I have also not had the opportunity to tour Verizon central offices on the east coast. I have, however, toured Verizon central offices in California as well as many other central offices. Based on my experience in touring other central offices including Verizon central offices, and based on my experience that Bell System Practices have always been very much standardized across the telecommunications industry, I do not anticipate that Massachusetts would be an exception. As such, I would expect that a distance of approximately 45 feet would be appropriate for these cabling distances.

Q. HAVE ANY COMMISSIONS MADE A DEFINITIVE DECISION ON THIS ISSUE THAT YOU ARE AWARE OF?

19 A. Yes. The Texas Public Utility Commission ("Texas PUC") evaluated precisely this
20 issue in determining what the distance should be between the incumbent BDFB and the

AT&T Information Request No. 5-9. Verizon's response to this information request directed AT&T to Verizon's response to AT&T Information Request No. 5-21. Since this information request did not exist, I reviewed Verizon's response to AT&T Information Request No. 5-12. Here again, Verizon did not provide "the engineering guideline (Bell System Practice or similar document) that outlines how Verizon is to engineer the deployment of BDFBs in its central offices," but instead, simply provided a spreadsheet of the distances that it implemented. This information was not responsive to the information request.

collocation arrangement. The Texas PUC determined that the cabling distance should be 55 feet.⁴¹ Interestingly, Southwestern Bell only asked for 75 feet statewide.

The Texas PUC has been recognized by the FCC in the Texas Section 271 Order as being a commission that has thoroughly evaluated collocation costs and is a model for other states to review. 42 As such, the Department may want to compare the rates that were developed in Texas given the 55-foot distance against those proposed in Massachusetts for similar amperages. For example, in Texas, 2-20 Amp DC Power Distribution Feeds (fused at 30 amps) have a nonrecurring cost of \$369.03 and a recurring cost of \$0.00. The same arrangement in Massachusetts as proposed by Verizon has a nonrecurring cost of \$0.00 and a recurring cost of \$15.16 per month. While the two cost structures are totally different, clearly after two years, Verizon will be recovering costs that are in excess of what the Texas PUC determined to be cost based. Much of this difference is because of the excessive distances assumed in Verizon's Massachusetts cost study. I will give just one other example to show that this problem actually gets more severe as the amperage increases (which is consistent with the geometric aspect of power cabling cost I discussed earlier). In Texas, 2-50 Amp DC Power Distribution Feeds (fused at 75 amps) have a nonrecurring cost of \$643.12 and a recurring cost of \$0.00. A similar arrangement in Massachusetts (fused at 70 amps) has a nonrecurring cost of \$0.00 and a recurring cost of \$60.94 per month. In

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Revised Arbitration Award, Docket No. 21333, Proceeding to Establish Permanent Rates for Southwestern Bell Telephone Company's Revised Physical and Virtual Collocation Tariffs, p. 70.

See generally Texas 271 Order at ¶¶ 73-74.

1		this case, after only 10 months, Verizon will be recovering costs that are in excess of
2		what the Texas PUC determined to be cost based. In short, Verizon's excessive
3		distances contribute to its costs being significantly above TELRIC based costs.
4 5	Q.	HAVE YOU BEEN ABLE TO CORRECT THIS ERROR IN VERIZON'S COST STUDY?
6	A.	To a certain extent, I have been able to correct for this problem in my restatement of
7		Verizon's cost study. In making this correction, I have used Verizon's material costs,
8		the proposed installation factor I described earlier in this testimony, and the 55-foot
9		distance for cabling identified by the Texas PUC. However, I have maintained the cost
10		recovery mechanism proposed by Verizon to avoid the complications of truing up to a
11		completely different rate structure. (Please refer to the discussion that follows in
12		subsection 5 of the collocation testimony to understand the implications of Verizon's
13		proposed rate structure more fully.)
14 15		5. <u>Concerns with Verizon's Rate Structure Modifications for Interconnection Arrangements</u>
16 17 18	Q.	WHAT CONCERN DO YOU HAVE WITH VERIZON'S MODIFICATION TO THE RATE STRUCTURE FOR INTERCONNECTION ARRANGEMENTS?
19	A.	Quite simply, Verizon has changed the way that it charges for interconnection
20		arrangements in Massachusetts from a recurring cost structure per interconnection
21		arrangement used to a largely nonrecurring cost structure per interconnection
22		arrangement ordered. The ramifications on the collocators may not be immediately
23		obvious from this statement. Perhaps the following illustration will make the problem
24		more apparent.

Presently, a collocator can order, for example, 2000 voice grade interconnection arrangements from Verizon in a particular central office, but is not required to pay for them until the collocator actually uses them to cross-connect an element (such as an unbundled loop) through the interconnection arrangement to the collocation arrangement. This arrangement places Verizon in the position where it has to expend resources to provide for these interconnection arrangements, but does not receive revenue until the interconnection arrangements are actually used.

A.

The approach that Verizon has proposed in Massachusetts is entirely different. Verizon wants to charge the collocator for all of the interconnection arrangements that are *ordered* immediately. In other words, for the example above, the collocator would pay a nonrecurring charge for all 2000 voice grade interconnection arrangement immediately, plus a smaller recurring charge for the space occupied on interconnection frames, racking, and associated maintenance. The bottom line is that this change in cost recovery would require all of the collocators in Massachusetts to immediately pay a large nonrecurring charge to Verizon.

Q. DO YOU HAVE A FUNDAMENTAL PROBLEM WITH VERIZON'S PROPOSED COST RECOVERY STRUCTURE?

No. I have proposed similar structures in many different parts of the country. This is also the structure that Verizon and many different CLECs in the Verizon-South (formerly Bell Atlantic) states arrived at. However, and this is extremely important, Verizon did not "flash-cut" this change in structure on the collocators in the Verizon-South states. Instead, Verizon worked with the various CLECs, and is still working

with these CLECs, to transition into the new structure. Moreover, Verizon also put
together a financial transitional plan for CLECs that were operating under the old
structure to move into the new structure. Verizon has not presented either of these in
Massachusetts. Verizon has simply put forward a significant change in the cost
recovery mechanism without a plan on how collocators would move into this structure.

Q. WHAT PROPOSAL DO YOU HAVE FOR THIS DEPARTMENT?

A. I would recommend that the Department pursue one of two alternatives. *First*, the Department could reject, completely, Verizon's new cost recovery structure and simply leave the situation as it presently stands in Massachusetts. *Second*, the Department could accept Verizon's new cost recovery structure but must first require Verizon to put together an appropriate transition plan for collocators in Massachusetts to move from one structure to the other. Any other choice by this Department could have devastating impacts on collocators in Massachusetts.

VI. CONCLUSION

A.

15 Q. PLEASE SUMMARIZE YOUR TESTIMONY.

With regard to dedicated transport, my testimony has shown that Verizon-MA has significantly overstated its forward-looking economic costs for dedicated interoffice transport and common (shared) transport. For dedicated interoffice transport, Verizon-MA made fundamental methodological errors in its study. The most significant is Verizon-MA's understatement of the capacity of the SONET rings, thereby significantly overstating the costs for the circuits riding those SONET rings. This is largely an error of not recognizing that every circuit that begins on a SONET ring must also be

terminated on that SONET ring thereby requiring two cards per DS3 circuit. In addition, Verizon-MA failed to study the dedicated transport circuits that are used by Verizon in its local network instead focusing on those that are used to serve IEC POP customers. My testimony has also shown that Verizon-MA's cost study also improperly includes DCS on most dedicated transport circuits regardless of whether the CLEC elects this element or not. Consistent with the Verizon-MA/AT&T and Verizon-MA/WorldCom interconnection agreements, and the FCC's Advanced Services Order, DCS should be treated as a separate unbundled element, which a CLEC has the option to purchase based upon weighing both the added cost and associated benefits of DCS combined with dedicated transport. Further, my testimony has shown that Verizon-MA's cost study also utilizes an installation factor for transport equipment that is significantly higher than even Verizon's own data demonstrates to be reasonable. Finally, this testimony has shown that Verizon-MA's development of the fill factors for DS1 to DS0 and DS3 to DS1 multiplexing do not adequately account for how this element is used by the CLEC.

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Further, this testimony has shown that Verizon-MA has significantly overstated the costs for common (shared) transport. Particularly, Verizon-MA has based the cost for common transport on its underlying dedicated transport cost study. Given that the corrections that I propose to Verizon-MA's dedicated transport cost study alter these costs, the results should also be incorporated into the common transport cost study. Additionally, Verizon-MA has significantly overstated the distance between its central offices in developing the cost for common transport thereby overstating the rate for this

element. I have altered the mileage to a figure that would be much closer to the appropriate TELRIC distance for this element.

With regard to collocation, this reply testimony has shown that Verizon-MA has significantly overstated the costs for collocation particularly related to DC Power and land and building space. Verizon-MA has made numerous and considerable errors in its proposed collocation cost studies that cause the resulting costs to no longer comport with the TELRIC principles required and adopted by the DTE. Several of Verizon-MA's proposed collocation rates represent significant departures from an efficient, forward-looking approach to developing the costs for collocation. Further, Verizon-MA has developed its collocation costs in a manner that clearly discriminates against CLECs with regard to the configuration used to deliver DC power. In short, Verizon-MA's proposed collocation costs particularly for DC Power should be rejected. My revised rates for all of Verizon-MA's collocation cost studies are included in Attachment SET-3. Moreover, the electronic work papers that I used to develop the proposed rates for both transport and collocation are included as Attachment SET-4.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

17 A. Yes.